Attorney Docket No.

A0034-US-NP

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of Maria Antonietta Grasso   Group Art Unit: 2161

Application No.: 09/746,917   Examiner: Cindy Nguyen

Filed: 12/22/2000   Confirmation No.: 3973

For: RECOMMENDER SYSTEM AND METHOD

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Sir:

LETTER

Enclosed herewith is an original Appellants' Brief on Appeal in the above-identified application. An oral hearing is not requested.

Please charge the fee for filing of the Appeal Brief to Xerox Corporation. Deposit Account No. 24-0025.

Respectfully submitted,

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Customer No.: 25453   Date December 13, 2005

PATENT APPLICATION

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of   Confirmation No.: 3973

Applicant: Antonietta Grasso, et al.   Customer No.: 25453

Application No.: 09/746,917   Examiner: Cindy Nguyen

Filed: 12/22/2000   Docket No.: A0034-US-NP

For: **RECOMMENDER SYSTEM AND METHOD**

BRIEF ON APPEAL

Appeal from Group 2161

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Application No. 09/746,917

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I.   REAL PARTY IN INTEREST

The real party in interest for this appeal and the present application is Xerox
Corporation, by way of an Assignment recorded in the U.S. Patent and Trademark Office at Reel
11409, Frame 954-956.

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II.   STATEMENT OF RELATED APPEALS AND INTERFERENCES

There are no prior or pending appeals, interferences or judicial proceedings, known to Appellant, Appellant's representative, or the Assignee. that may be related to, or which will directly affect or be directly affected by or have a bearing upon the Board's decision in the pending appeal.

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Application No. 09/746,917

III.   STATUS OF CLAIMS

Claims 10, 12, 14, 25, 27 and 29 are on appeal.

Claims 10, 12, 14, 25, 27 and 29 are pending.

Claims 10, 12, 14, 25, 27 and 29 are rejected.

Claims 1-9, 11, 13, 15-24, 26, 28, 30-36 are canceled.

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IV.   STATUS OF AMENDMENTS

No Amendment After Final Rejection has been filed.

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V.   SUMMARY OF CLAIMED SUBJECT MATTER

The system and method of the invention gathers recommendations without the active participation of users, by deducing implicit recommendations from a work group's use of a shared recording device, such as a printer. a copier. a scanner or a set of printers, copiers or scanners, or some combination thereof. The invention of claim 10 is directed to a system 100 for providing item recommendations, comprising: a memory 40; a device 10, responsive to a user request, for recording an item on a hardcopy medium, wherein recording the item on a hardcopy medium comprises an implicit rating for the item by the user: a processor, for storing ratings of items and for generating recommendations for new items based on recommendation criteria (patent application [hereinafter "pa"], page 4, lines 1-4 and Figure 1, page 8, lines 8-15). In response to the user request (the recording of the item on a hardcopy medium), the processor stores an implicit rating for the recorded item in the memory, determines whether, based on the implicit rating and the recommendation criteria, to generate an item recommendation, and if the criteria for generating a recommendation is met, generates a recommendation of a new item (pa, page 4, lines 4-8, Figure 1 and pa page 8, lines 11-13). The memory 40 stores user profiles 46 for users of the system, wherein each user profile includes a set of user preferences pertaining to items (pa, page 8, lines 10-12). The processor, responsive to the recorded item, updates the user's profile with the implicit rating of the recorded item (pa page 8, lines 14-15). The processor further stores a representation of the recorded item in memory and determines an item similarity for the recorded item with other items stored in the memory by comparing the stored representation of the recorded item with the stored representations of other recorded items stored in the memory (pa page 4, lines 11-18). The processor characterizes content of the recorded item using linguistic tools and wherein the processor determines an item to item similarity between two recorded items by calculating a sum of weights of keywords in common divided by a sum of weights of all keywords associated with the two recorded items (pa, page 22, claim 10).

The invention of claim 25 is similar to the invention of claim 10 and is directed to, in a system for providing item recommendations. comprising: a memory; a device for recording an item on a hardcopy medium; and a processor, for storing ratings of items and for generating recommendations for new items based on recommendation criteria, a method for operating the system for generating recommendations. comprising: providing a user request

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for recording an item on a hardcopy medium; storing an implicit rating of the requested item, wherein recording the item on a hardcopy medium comprises an implicit rating for the item by the user; determining whether, based on the implicit rating for the recorded item and recommendation criteria, to generate an item recommendation; if the criteria for generating a recommendation is met, generating a recommendation of a new item; storing user profiles for users providing user requests, wherein each user profile includes a set of user preferences pertaining to items and responsive to the recorded item, updating the requesting user's profile with the implicit rating for the recorded item; calculating an item similarities rating between two recorded items by calculating a sum of weights of keywords in common divided by a sum of weights of all keywords associated with the two recorded items.

The invention of claim 12 is directed to system for providing item recommendations, comprising: a memory 40; a device 10, responsive to a user request, for recording an item on a hardcopy medium, wherein recording the item on a hardcopy medium comprises an implicit rating for the item by the user; a processor, for storing ratings of items and for generating recommendations for new items based on recommendation criteria (patent application [hereinafter "pa"], page 4, lines 1-4 and Figure 1, page 8, lines 8-15). In response to the user request (the recording of the item on a hardcopy medium), the processor stores an implicit rating for the recorded item in the memory. determines whether, based on the implicit rating and the recommendation criteria, to generate an item recommendation, and if the criteria for generating a recommendation is met, generates a recommendation of a new item (pa, page 4, lines 4-8, Figure 1 and pa page 8, lines 11-13). The memory 40 stores user profiles 46 for users of the system, wherein each user profile includes a set of user preferences pertaining to items (pa, page 8, lines 10-12). The processor, responsive to the recorded item, updates the user's profile with the implicit rating of the recorded item (pa page 8, lines 14-15). The processor characterizes content of the recorded item using linguistic tools and wherein the processor generates a historical linguistic user profile for each user comprising a list of terms extracted from user recorded items and frequency of occurrence of such extracted terms and wherein the processor generates a current linguistic user profile for each user comprising a list of terms extracted from user recorded items with terms being weighted by a damping coefficient, e^{-rt}, where $t = today - timestamp$ of association of the recorded item with the user and α is a damping coefficient (pa page 13, line 16-25)

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The invention of claim 27 is similar to the invention of claim 12 and is directed to, in a system for providing item recommendations, comprising: a memory; a device for recording an item on a hardcopy medium; and a processor, for storing ratings of items and for generating recommendations for new items based on recommendation criteria, a method for operating the system for generating recommendations, comprising: providing a user request for recording an item on a hardcopy medium; storing an implicit rating of the requested item, wherein recording the item on a hardcopy medium comprises an implicit rating for the item by the user; determining whether, based on the implicit rating for the recorded item and recommendation criteria, to generate an item recommendation; if the criteria for generating a recommendation is met, generating a recommendation of a new item storing user profiles for users providing user requests, wherein each user profile includes a set of user preferences pertaining to items and responsive to the recorded item, updating the requesting user's profile with the implicit rating for the recorded item; characterizing content of the recorded item using linguistic tools; generating a historical linguistic user profile for each user comprising a list of terms extracted from user recorded items and frequency of occurrence of such extracted terms; and generating a current linguistic user profile for each user comprising a list of terms extracted from user recorded items with terms being weighted by a damping coefficient, $e^{-\alpha t}$, where $t = today - timestamp$ of association of the recorded item with the user and α is the damping coefficient.

The invention of claim 14 is directed to a system 100 for providing item recommendations, comprising: a memory 40; a device 10, responsive to a user request, for recording an item on a hardcopy medium, wherein recording the item on a hardcopy medium comprises an implicit rating for the item by the user; a processor, for storing ratings of items and for generating recommendations for new items based on recommendation criteria (patent application [hereinafter "pa"], page 4, lines 1-4 and Figure 1, page 8, lines 8-15). In response to the user request (the recording of the item on a hardcopy medium), the processor stores an implicit rating for the recorded item in the memory, determines whether, based on the implicit rating and the recommendation criteria, to generate an item recommendation, and if the criteria for generating a recommendation is met, generates a recommendation of a new item (pa, page 4, lines 4-8, Figure 1 and pa page 8, lines 11-13). The memory 40 stores user profiles 46 for users of the system, wherein each user profile includes a set of user preferences pertaining to items (pa, page 8, lines 10-12). The processor, responsive to the

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recorded item, updates the user's profile with the implicit rating of the recorded item (pa page 8, lines 14-15). The processor characterizes content of the recorded item using linguistic tools, wherein the processor generates a linguistic user profile for each user comprising a list of terms extracted from user recorded items and frequency of occurrence of such extracted terms, and wherein the processor determines an overlap between a user's linguistic profile and a recorded item's linguistic content characterization (pa page 13, line 28 - page 14, line 2).

The invention of claim 29 is similar to the invention of claim 14 and is directed to, in a system for providing item recommendations, comprising: a memory; a device for recording an item on a hardcopy medium; and a processor, for storing ratings of items and for generating recommendations for new items based on recommendation criteria, a method for operating the system for generating recommendations, comprising: providing a user request for recording an item on a hardcopy medium; storing an implicit rating of the requested item, wherein recording the item on a hardcopy medium comprises an implicit rating for the item by the user; determining whether, based on the implicit rating for the recorded item and recommendation criteria, to generate an item recommendation; if the criteria for generating a recommendation is met, generating a recommendation of a new item; storing user profiles for users providing user requests, wherein each user profile includes a set of user preferences pertaining to items and responsive to the recorded item, updating the requesting user's profile with the implicit rating for the recorded item; characterizing content of the recorded item using linguistic tools; generating a linguistic user profile for each user comprising a list of terms extracted from user recorded items and frequency of occurrence of such extracted terms; and determining an overlap between a user's linguistic profile and a recorded item's linguistic content characterization.

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VI.   GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL.

The following grounds of rejection are presented for review:

Claims 10, 12, 14, 25, 27 and 29 are rejected as having been obvious under 35 U.S.C.

§103(a) over Chislenko et al (U.S. Patent No. 6,092,049) in view of Hosken (U.S. Patent No.

6,438,579).

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VII.   ARGUMENT

The invention is directed to a recommender system and method of making recommendations that uses implicitly created recommendations from the act of recording an item. The invention gathers recommendations without the active participation of users, by deducing implicit recommendations from a work group's use of a shared recording device, such as a printer, a copier, a scanner or a set of printers, copiers or scanners, or some combination thereof. The action of recording (e.g.. printing, scanning, copying) is taken to be an implicit declaration of interest in the item being recorded. Users retain the capability to actively recommend documents to the system, if a separate input interface is provided to receive explicit rating input.

A.   Claims 10, 12, 14, 25, 27 and 29 Would Not Have Been Obvious Over Chislenko et al (U.S. Patent No. 6,092,049) in view of Hosken (U.S. Patent No. 6,438,579).

Neither Chislenko nor Hosken recognizes that the act of recording an item can be an implicit rating of an item. Chislenko is concerned with the problem of improving recommendations in a system that employs automated collaborative filtering by calculating similarity profiles between users. Chislenko infers ratings by monitoring the user's usage pattern, such as the time a user spends viewing a particular Web page (see col. 4, lines 44-59). However, Chislenko does not recognize that the action of recording an item can be used as an implicit rating of an item. Hosken is concerned with the problem of combining content-based filtering and progressively refined collaborative-based filtering to provide recommendations. Hosken also generates implicit ratings by monitoring a user's actions, such as the amount of time spent reading a particular item (see col. 5, lines 52-56 and col. 6, lines 25-29). However, Hosken does not recognize that the action of recording an item can be used as an implicit rating of an item.

1.   Chislenko does not teach "a device, responsive to a user request, for recording an item on a hardcopy medium". The only teaching in Chislenko regarding a printer (or recording device) is as a means of displaying a list of recommendations to a user. Chislenko at col. 14, lines 7-10, states "Recommendations can take any of a number of forms. For example, recommended items may be output as a list, either printed on paper by a printer, visually displayed on a display screen, or read aloud." The only other reference to a printer in Chislenko teaches that a printer is a device for displaying recommendation to a

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user (see col. 27, lines 1-3, and col. 28, lines 25-35 and lines 36-46). A recommender system displaying a list of recommended items (or printing them out on paper by a printer) or use by a user is not the same as when a user requests printing an item on a paper by a printer. Recording the item on a hardcopy medium (e.g., printing an item requested by the user) comprises an implicit rating for the item by the user.

2.   Chislenko does not teach or suggest that recording an item on a hardcopy medium comprises an implicit rating for the item by the user. Chislenko's system recognizes that ratings can be inferred from the user's usage pattern, such as how long a user views a Web page (see col. 4, lines 44-59). However, Chislenko's system does not recognize that the act of printing an item in response to a user request could be used as an implicit rating for the item by the user. Indeed, most of the description of Chislenko's system pertains to eliciting explicit ratings from users. "Ratings that are inferred by the system may be assumed to be less valid than ratings that are actually entered by the user." See col. 5, lines 32-34.

3.   Hosken does not teach or suggest that recording an item on a hardcopy medium comprises an implicit rating for the item by the user: Hosken teaches that browsing actions can be used as implicit ratings. According to Hosken, "the level of interest in particular recommended media content items, particularly as can be inferred through the browsing of such recommendations . . . is stored as part of the user profile" (col. 7, lines 38-42). See also Fig. 3, elements 88 and 80. As best Hoskens is understood, there is no mention of recording an item on a hardcopy medium; there is no recognition in Hoskens that the act of printing an item in response to a user request could be used as an implicit rating for the item by the user.

4.   Hosken's system is entirely virtual; there are no printers or other recording devices in Hoskens. As best Hoskens is understood, users rate items online when viewing the items; there are no printers or other recording devices used to generating ratings. See Fig. 1 of Hosken and col. 4, lines 29-44. "The system and methods . . . provide for a user, operating a user computer system 12 with a network access supported interface 14, such as a conventional Web browser application, to access and navigate, via a communications network 16, through information presented by a server computer system 18." The only mention of "recording" in the Examiner cited quotation is at col. 7, lines 37-

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39: "A history of the recommendation sets presented to a user may also be recorded in or stored in connection with the user profile." Recording a history of recommendation sets is not the same as recording an item on a printer.

1. Claims 10 and 25.

    a.   Chislenko does not characterizing content of the recorded item using linguistic tools and determining an item to item similarity between two recorded items by calculating a sum of weights of keywords in common divided by a sum of weights of all keywords associated with the two recorded items.

The Examiner cited col. 19, lines 55-60 for teaching the above language. According to Chislenko at col. 19, line 22, a "feature value" is used to describe any information stored about a particular feature of the item. At col. 19, line 2, "features may have numerous values, such as terms appearing as 'keywords' in a document." According to Chislenko, one method of defining the similarity between two features values [two keywords] is to take a simple average. See col. 19, lines 55-60. Chislenko goes on to define:

$$\overline{v}_I^{\alpha x} = \begin{cases} \dfrac{\displaystyle\sum_{p=1}^{\|Items\|} (R_{I,p} \times c_{I,p} \times \Gamma_p^{\alpha x})}{\displaystyle\sum_{p=1}^{\|Items\|} (c_{I,p} \times \Gamma_p^{\alpha x})} & \textit{iff} \left(\displaystyle\sum_{p=1}^{\|Items\|} c_{I,p} \times \Gamma_p^{\alpha x} \right) \geq 1 \\ \\ \textit{Undefined} & \textit{otherwise} \end{cases}$$

to be the mean of the rating given to each item containing a particular feature value that a user has rated. As best as Chislenko is understood this relationship is not the same as calculating a sum of weights of keywords in common divided by a sum of weights of all keywords associated with the two recorded items.

2. Claims 12 and 27

    a.   Chisenko does not teach wherein the processor characterizes content of the recorded item using linguistic tools and wherein the processor generates a historical linguistic user profile for each user comprising a list of terms extracted from user

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recorded items and frequency of occurrence of such extracted
terms and wherein the processor generates a current linguistic
user profile for each user comprising a list of terms extracted
from user recorded items with terms being weighted by a
damping coefficient, $e^{-\alpha t}$, where $t = today - timestamp$ of
association of the recorded item with the user and α is a
damping coefficient.

The Examiner cited col. 12, line 64 to col. 13, line 9 and col. 9, lines 34-50 of
Chislenko for disclosing the above language. Col. 12, line 64 to col. 13, line 9, as best it is
understood, refers to updating a similarity factor for a third user when new similarity factors
are being calculated for two users. Col. 9, lines 34-50, as best it is understood, refers to
calculating a correlation coefficient.

3.   Claims 14 and 29

    a.   Chislenko does not teach wherein the processor characterizes
content of the recorded item using linguistic tools, wherein the
processor generates a linguistic user profile for each user
comprising a list of terms extracted from user recorded items
and frequency of occurrence of such extracted terms, and
wherein the processor determines an overlap between a user's
linguistic profile and a recorded item's linguistic content
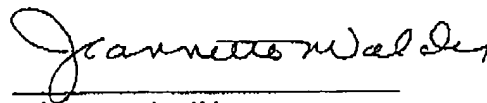characterization.

The Examiner cited col. 13, lines 10-25 of Chislenko for disclosing the above
language. The cited language refers to calculating a degree of item overlap by dividing the
number of overlapping concepts in two items by the total number of concepts to which both
items belong. Determining an overlap between two items is not the same as determining an
overlap between a user's linguistic profile and a recorded item's linguistic content
characterization.

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VIII.   CONCLUSION

For all of the reasons discussed above, it is respectfully submitted that the rejections

are in error and that Claims 10, 12, 14, 25, 27 and 29 are in condition for allowance. For all of

the above reasons, Appellants respectfully request this Honorable Board to reverse the rejections

of Claims 10, 12, 14, 25, 27 and 29.

Respectfully submitted,

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Xerox Corporation
Santa Ana, California

Filed: December 13, 2005

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CLAIMS APPENDIX

CLAIMS INVOLVED IN THE APPEAL:

1-9   (Canceled).

10.   (Previously Presented)   A system for providing item recommendations, comprising:

a memory;

a device, responsive to a user request, for recording an item on a hardcopy medium, wherein recording the item on a hardcopy medium comprises an implicit rating for the item by the user;

a processor, for storing ratings of items and for generating recommendations for new items based on recommendation criteria;

wherein, responsive to the recording of the item on a hardcopy medium, the processor stores the implicit rating for the recorded item in the memory, determines whether, based on the implicit rating for the recorded item and the recommendation criteria, to generate an item recommendation, and if the criteria for generating a recommendation is met, generates a recommendation of a new item;

wherein the memory stores user profiles for users of the system, wherein each user profile includes a set of user preferences pertaining to items and wherein the processor, responsive to the recorded item, updates the user's profile with the implicit rating of the recorded item;

wherein the processor further stores a representation of the recorded item in memory and determines an item similarity for the recorded item with other items stored in the memory by comparing the stored representation of the recorded item with the stored representations of other recorded items stored in the memory;

wherein the processor characterizes content of the recorded item using linguistic tools and wherein the processor determines an item to item similarity between two recorded items by calculating a sum of weights of keywords in common divided by a sum of weights of all keywords associated with the two recorded items.

11.   (Canceled).

12. (Previously Presented) A system for providing item recommendations, comprising:

a memory;

a device, responsive to a user request, for recording an item on a hardcopy medium, wherein recording the item on a hardcopy medium comprises an implicit rating for the item by the user;

a processor, for storing ratings of items and for generating recommendations for new items based on recommendation criteria;

wherein, responsive to the recorded item, the processor stores an implicit rating for the recorded item in the memory, determines whether, based on the implicit rating for the recorded item and the recommendation criteria, to generate an item recommendation, and if the criteria for generating a recommendation is met, generates a recommendation of a new item;

wherein the memory stores user profiles for users of the system, wherein each user profile includes a set of user preferences pertaining to items and wherein the processor, responsive to the recorded item, updates the user's profile with the implicit rating of the recorded item;

wherein the processor characterizes content of the recorded item using linguistic tools and wherein the processor generates a historical linguistic user profile for each user comprising a list of terms extracted from user recorded items and frequency of occurrence of such extracted terms and wherein the processor generates a current linguistic user profile for each user comprising a list of terms extracted from user recorded items with terms being weighted by a damping coefficient, $e^{-\alpha t}$, where $t = today - timestamp$ of association of the recorded item with the user and α is a damping coefficient.

13. (Canceled).

14. (Previously Presented) A system for providing item recommendations, comprising:

a memory;

a device. responsive to a user request. for recording an item on a hardcopy medium wherein recording the item on a hardcopy medium comprises an implicit rating for the item by the user;

a processor, for storing ratings of items and for generating recommendations for new items based on recommendation criteria;

wherein, responsive to the recorded item, the processor stores an implicit rating for the recorded item in the memory, determines whether, based on the implicit rating for the recorded item and the recommendation criteria, to generate an item recommendation, and if the criteria for generating a recommendation is met, generates a recommendation of a new item;

wherein the memory stores user profiles for users of the system, wherein each user profile includes a set of user preferences pertaining to items and wherein the processor, responsive to the recorded item, updates the user's profile with the implicit rating of the recorded item;

wherein the processor characterizes content of the recorded item using linguistic tools, wherein the processor generates a linguistic user profile for each user comprising a list of terms extracted from user recorded items and frequency of occurrence of such extracted terms, and wherein the processor determines an overlap between a user's linguistic profile and a recorded item's linguistic content characterization.

15-24 (Canceled).

25.   (Previously Presented)   In a system for providing item recommendations. comprising: a memory: a device for recording an item on a hardcopy medium; and a processor, for storing ratings of items and for generating recommendations for new items based on recommendation criteria, a method for operating the system for generating recommendations, comprising:

providing a user request for recording an item on a hardcopy medium;

storing an implicit rating of the requested item, wherein recording the item on a hardcopy medium comprises an implicit rating for the item by the user;

determining whether. based on the implicit rating for the recorded item and recommendation criteria, to generate an item recommendation;

if the criteria for generating a recommendation is met. generating a recommendation of a new item:

storing user profiles for users providing user requests, wherein each user profile includes a set of user preferences pertaining to items and responsive to the recorded item, updating the requesting user's profile with the implicit rating for the recorded item;

calculating an item similarities rating between two recorded items by calculating a sum of weights of keywords in common divided by a sum of weights of all keywords associated with the two recorded items.

26. (Canceled).

27. (Previously Presented) In a system for providing item recommendations, comprising: a memory; a device for recording an item on a hardcopy medium; and a processor, for storing ratings of items and for generating recommendations for new items based on recommendation criteria, a method for operating the system for generating recommendations, comprising:

providing a user request for recording an item on a hardcopy medium;

storing an implicit rating of the requested item, wherein recording the item on a hardcopy medium comprises an implicit rating for the item by the user;

determining whether, based on the implicit rating for the recorded item and recommendation criteria, to generate an item recommendation;

if the criteria for generating a recommendation is met. generating a recommendation of a new item

storing user profiles for users providing user requests, wherein each user profile includes a set of user preferences pertaining to items and responsive to the recorded item, updating the requesting user's profile with the implicit rating for the recorded item;

characterizing content of the recorded item using linguistic tools;

generating a historical linguistic user profile for each user comprising a list of terms extracted from user recorded items and frequency of occurrence of such extracted terms: and

generating a current linguistic user profile for each user comprising a list of terms extracted from user recorded items with terms being weighted by a damping

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coefficient, $e^{-\alpha r}$, where $r = today - timestamp$ of association of the recorded item with the user and α is the damping coefficient.

28.   (Canceled).

29.   (Previously Presented)   In a system for providing item recommendations, comprising: a memory; a device for recording an item on a hardcopy medium; and a processor, for storing ratings of items and for generating recommendations for new items based on recommendation criteria, a method for operating the system for generating recommendations, comprising:

    providing a user request for recording an item on a hardcopy medium;

    storing an implicit rating of the requested item, wherein recording the item on a hardcopy medium comprises an implicit rating for the item by the user;

    determining whether, based on the implicit rating for the recorded item and recommendation criteria, to generate an item recommendation;

    if the criteria for generating a recommendation is met. generating a recommendation of a new item:

    storing user profiles for users providing user requests, wherein each user profile includes a set of user preferences pertaining to items and responsive to the recorded item, updating the requesting user's profile with the implicit rating for the recorded item;

    characterizing content of the recorded item using linguistic tools;

    generating a linguistic user profile for each user comprising a list of terms extracted from user recorded items and frequency of occurrence of such extracted terms; and

    determining an overlap between a user's linguistic profile and a recorded item's linguistic content characterization.

30-36 (Cancelled).

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EVIDENCE APPENDIX

NONE

B-1

RELATED PROCEEDINGS APPENDIX

NONE

C-1